* NOTICES *



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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]
The equipment and the approach of separating the cell component of blood from the liquid part of blood Background of invention Especially this invention relates to the equipment and the approach for separating the cell element of blood from the liquid part of the blood relevant to determining the description of a blood sample.
There is a chromatography assay system among many analysis systems used for detection and/or measurement of analyte, especially the analyte on which an interest leans biologically.
Such a chromatography system is often used for a list by a doctor and the medicine engineer for the monitor on the therapy of various conditions and a disease for the quick medical examination in the clinic. **** use of such a chromatography system has been done by the patient itself again for the monitor in the home of such a condition and a disease.
There is a "thin layer" system which a solvent crosses a thin flat adsorbent medium and moves as most important thing among such systems. As most important thing among the tests performed by such thin layer system, immunoassay occurs and this is dependent on the specific interaction between the antigen or hapten which forms an antigen-antibody complex, and a corresponding antibody. The antigen which should be detected can serve as an antibody in itself like [ in the serological verification for example, to an H. pylori (H. pylori)-specific antibody ]. In such a case, the antibody which should be detected is also combinable with a specific antigen. As an exception method, the antigen which should be detected is indirectly detected using the 2nd antibody which combines the 1st antibody with the analyte which should be detected and which labeled. Clinically, after such immunoassays as a means of existence of an important molecule and/or the test about an amount are known, they are formed considerably.
J.M.Singer has reported the use of a latex agglutination test based on the immunity which detects the factor relevant to chronic articular rheumatism in 1956 (Singer et al., Am. J. Med. 22:888-892 (1956)). immunoassay is used with chromatography-an approach and equipment -- having -- **** --; -- this combination is known as an immunity chromatography.
Immunity chromatography assay is divided into two main classes "sandwiches" and "contention" according to a series of reactions required to produce the property of the antigen-antibody complex which should be detected, and its complex.
The example of the sandwiches immunoassay performed to a test strip is Grubb. et U.S. Pat. No. 4,168,146 of al., and Tom et It is indicated by U.S. Pat. No. 4,366,241 (both make the publication with some specifications with reference to here.) of al.
In contention immunoassay, a revelation reagent (disclosing reagent) is typically combined with the analyte or the analytes themselves which competes to association by the analyte and the antibody which exist in a sample, and by which labeling is not carried out. Contention immunoassay is hapten (each hapten is monovalence and can combine only one antibody molecule).
** -- it is typically used to detection of analyte [ like ]. Cocaine, heroin, and these metabolite are in the example of hapten as abuse drugs at a remedy, for example, theophylline, and a digoxin list. The example of contention immunoassay equipment is Deutsch. et U.S. Pat. No. 4,235,601 of al., U.S. Pat.

No. 4,442,204 of Liotta, and Buechler et There are some which were indicated by U.S. Pat. No. 5,208,535 (these make the publication with some specifications with reference to here.) of al.
One of the samples oftenest authorized about the analyte using a test strip or the same equipment is blood. Most typically, the analyte which should be authorized is the fusibility component, i.e., the blood serum, or plasma in the liquid part of blood. These two components are similar considering the point that the blood serum obtained from the blood sample which carried out clot of blood lacks the fin buri no gene lost as a result of a clot-of-blood process, or a certain kind of other clot-of-blood factors, as another.
Most typically, a clinical person or an engineer collects a blood sample (it is an often quite little sample). It is desirable that all blood samples can be used for assay, and it is desirable to avoid the need for preparation of the bulk of the blood serum from a blood sample or plasma. However, in almost all the test strip and same analysis apparatus, even use of the blood sample except use of the whole blood liquid as a sample or a cell, especially an erythrocyte is not partially desirable.
A blood cell, especially an erythrocyte make late first flow of the blood serum which meets the film, or plasma, finally, block membranous pore and stop flow. This serves as an invalid test. Migration of an erythroid cell or other blood cells blocks the engine performance of the test which produces a high background again or is performed by assay equipment. a blood cell -- a fine hole -- although removed by the filtration which lets a filter pass, work of such a filter does not enable effective assay of the blood which is too late and does not usually contain a cell.
Furthermore, even if a blood cell is removed effectively, as for the approach of performing it, hemolysis is often caused. Since generating of hemolysis brings about the enzyme to the part which does not contain the cell of blood, hemoglobin, other coloring matter, and emission of stroma, it is not desirable. This blocks many clinical trials.
Various methods of separating a blood cell from the liquid part of blood are Grubb. et U.S. Pat. No. 3,768,978 of al., U.S. Pat. No. 3,902,964 of Greenspan, Vogel et U.S. Pat. No. 4,477,575 of al., U.S. Pat. No. 4,594,372 of Zuk, Hillman et U.S. Pat. No. 4,753,776 of al., Vogel et U.S. Pat. No. 4,816,224 of al., Aunet et U.S. Pat. No. 4,933,092 of al., Trasch et 5,055,195th United States patent Jeng of al. et U.S. Pat. No. 5,064,541 of al., Roesink et U.S. Pat. No. 5,076,925 of al., Sand et U.S. Pat. No. 5,118,428 of al., Tanaka U.S. Pat. No. 5,118,472 of etal., Makino et U.S. Pat. No. 5,130,258 of al., Hillman et U.S. Pat. No. 5,135,719 of al., Forney et U.S. Pat. No. 5,209,904 of al., Maddox et U.S. Pat. No. 5,212,060 of al., Koenhen et U.S. Pat. No. 5,240,862 of al., Wilk et U.S. Pat. No. 5,626,067 of al., Kiser et U.S. Pat. No. 5,306,623 of al., U.S. Pat. No. 5,397,479 of Ogura al. et (these all refer to and make the publication with some specifications.) U.S. Pat. No. 5,364,533 and Kass of al. et It is alike and is indicated.
However, in addition, the approach of having been improved which separates the cell component of blood from the liquid part of blood is needed about quick and exact assay of the analyte contained in the liquid part of blood. The one-equipment which incorporated the element and means of assay for separating the liquid part of blood from the cell component of blood is needed so that it can authorize easily with equipment with the single analyte which exists in the liquid part of blood especially. Such improved equipment will avoid the need for the preliminary extract of a blood serum or plasma with the need that safe abandonment of blood fractionation accompanies. This originates in the big breadth of the disease relevant to blood like hepatitis or an acquired immunode-ficiency syndrome, and poses a serious problem. The improved equipment will enable direct assay of desired analyte, if a whole blood sample is applied to equipment.
Preferably, such equipment performs immunoassay of the large range including both sandwiches immunoassay and contention immunoassay.
Epitome We developed the assay equipment and the approach for the equipment and the approaches of separating the liquid part of whole blood from the cell component of the blood corresponding to these demands, and those use.
One mode of equipment is equipment which separates the liquid part of blood from the cell component of blood. The pad made from the porous matter which can catch the cell component of blood although the liquid part of (1) blood is penetrated, the base which supports (2) pad -- and -- It is equipment which

comes to provide the means attached in the pad for promoting the flow of the liquid part of blood from the pad made from (ii) porosity matter through the surrounding gap of the cell component of the blood with which it was caught in (3) (i) pad.
Separation of the liquid part of the blood from the cell component of blood takes place by the flow which minds a pad without significant hemolysis.
Typically, the pad made from the porous matter contains the binder to the cell component of blood. If a binder is an anti-blood cell antibody, it is an anti-erythrocyte antibody preferably. If a binder is lectin, the lectins of many classes are suitable for use.
As an exception method, you may sink in with the carbohydrate with which a pad can condense a blood cell.
Many carbohydrates fit use. Preferably, a carbohydrate is a mannitol.
Although the pad made from the porous matter of this equipment penetrates the 1st sector which penetrates both liquid part of (i) blood, and cell component of blood, and the liquid part of (ii) blood, it can contain two sectors of 2nd sector ** which can combine the cell component of blood.
The pad made from the porous matter which can catch the cell component of blood as an exception method although the liquid part of blood is penetrated The unsymmetrical film which has the 1st front face and 2nd front face may be included in it. This film It has the inclination of pore size so that it may apply to the 2nd front face from the 1st front face and pore size may become small, and this unsymmetrical film can catch the cell component of blood in it, and the liquid component of blood is passed.
The means attached in the pad for promoting the flow of the liquid part of said blood contains the film for chromatography-separation in it typically, and the film for the chromatography-separation has a prehension zone typically on it, in order to combine the member of a specific binding pair.
This equipment and the similar equipment of everything but the following can be used by the approach of separating the liquid part of blood from the cell component of blood. When the film for chromatography-separation is included, equipment is used by the approach of performing assay for detecting and/or measuring at least one analyte in the liquid part of a blood sample.
One mode of this invention is equipment which separates the liquid part of blood from the cell component of blood. The 1st porous separation matrix which can catch the cell component of blood although the liquid part of (1) blood is penetrated, It reaches. (2) It is equipment which comes to provide the 2nd porous matrix in contact with the 1st porous separation matrix and actuation target which enables the liquid part of blood to flow according to capillary action or chromatography-separation through the 2nd porous matrix.
Separation of the liquid part of the blood from the cell component of blood takes place by the flow which leads the 2nd matrix without significant hemolysis to the 1st.
Typically, the 2nd matrix is the film for chromatography-separation and, thereby, builds assay equipment with this mode of the equipment of this invention. Typically, the film for chromatography-separation has a prehension zone for combining the member of a specific binding pair on it.
If the 2nd matrix is the film for chromatography-separation The approach of performing assay for detecting and/or measuring at least one analyte in the liquid part of a blood sample The phase which applies the sample of (1) blood to the 1st porous separation matrix of equipment, Phase of separating a sink and the liquid part of a blood sample for (2) blood sample from the cell component of a blood sample through the 1st porous separation matrix As a result of an operation of the (3) 2nd matrix The phase which promotes the flow of the liquid part of the blood which leads the surrounding gap of the cell component of the caught blood, It reaches. The 2nd matrix is made for the liquid part of blood to flow so that (4) assays may be performed by the 2nd matrix. Each phase of the phase where assay is performed shall be included by combining the member of a specific binding pair with the prehension zone of the 2nd matrix, and detecting and/or measuring said at least one analyte.
The 1st separation matrix can be used as the unsymmetrical film which has the 1st front face and 2nd front face. It has the inclination of pore size so that the film may be covered over the 2nd front face from the 1st front face and pore size may become small, and the unsymmetrical film can catch the cell

component of blood in it, and the liquid component of blood is passed.
Typically, equipment comes further to contain the impermeable solid-state base material which the 2nd matrix fixed.
Still more nearly another mode of this invention is equipment which separates the liquid part of blood from the cell component of the blood which comes to provide three matrices. Such equipment The 1st porous separation matrix which can catch the cell component of blood although the liquid part of (1) blood is penetrated, The 2nd porous separation matrix in contact with the 1st porous separation matrix and actuation target which can catch the cell component of blood although the liquid part of (2) blood is penetrated, It reaches. (3) The 3rd porous matrix in contact with the 2nd porous separation matrix and actuation target which enables the liquid part of blood to flow according to capillary action or chromatography-separation through the 2nd porous matrix shall be provided.
Separation of the liquid part of the blood from the cell component of blood takes place by the flow which leads the 2nd porous separation matrix without significant hemolysis to the 1st.
Still more nearly another embodiment of the equipment of this invention has many 2nd porous matrix. Such equipment The 1st porous separation matrix which can catch the cell component of blood although the liquid part of (1) blood is penetrated, It reaches. (2) Each 2nd porous matrix minds the 2nd porous matrix. According to capillary action or chromatography-separation It comes to provide 2nd at least two porous matrix in contact with the 1st porous separation matrix and actuation target which enables the liquid part of blood to flow.
Still more nearly another mode of this invention is equipment which consists of two components which separate the liquid part of a blood sample from a cell component. This equipment The 1st porous separation matrix which can catch the cell component of blood although the liquid part of (1) and (a) blood is penetrated, It reaches. (b) The component including the 2nd porous matrix in contact with the 1st porous separation matrix and actuation target which enables the liquid part of blood to flow according to capillary action or chromatography-separation through the 2nd porous matrix which can counter the 1st, In a list (2) The component in which the 1st and the 2nd opposite are possible is made to counter, and it comes to provide the component which can be attached in the component which makes a fluid transport to another side with a pressure from one side of the component which can counter, and which can counter the 1st and which can counter the 2nd.
Separation of the liquid part of the blood from the cell component of blood takes place by the flow which leads the 1st and the 2nd matrix of the component which can counter the 1st without significant hemolysis.
The component which can counter the 2nd can contain the specific binding partner by whom the indicator was done including the sample preparation zone with the indicator which this detects [ at least one reagent for processing of a sample or ], and a specific binding partner has specific binding affinity for at least one component chosen from the specific binding partner and analyte to the analyte which is the gestalt in which re-solubilization is possible by addition of the aquosity sample to a sample preparation zone.
The equipment which consists of two components which suit especially 2 direction assays The 1st porous separation matrix which can catch the cell component of blood although the liquid part of (1) and (a) blood is penetrated, It reaches. (b) The 2nd porous matrix is minded. According to capillary action or chromatography-separation The component including the 2nd porous matrix containing the film for the chromatography-separation in contact with the 1st porous separation matrix and actuation target which enables the liquid part of blood to flow in the 1st direction which can counter the 1st, In a list (2) Make the component in which the 1st and the 2nd opposite are possible counter, and a reagent is made to transport to the component which can counter the 1st with a pressure from the component which can counter the 2nd. Making the component in which the 1st and the 2nd opposite are possible counter the reagent transported to the component which can counter the 1st from the component which can counter the 2nd The component which can be attached in the component to which it is made to move through the 2nd porous matrix in the 2nd direction opposite to the 1st direction, and which can counter the 1st and which can counter the 2nd shall be provided.

In this mode, separation of the liquid part of the blood from the cell component of blood takes place by the flow which leads the 1st and the 2nd matrix of the component which can counter the 1st without significant hemolysis.
Another mode of this invention is the approach of separating the liquid part of blood from the cell component of blood. The phase of adding the bridge formation matter to the cell component of the blood which is the bridge formation matter chosen from the group which consists of a carbohydrate which can make (1) lectin, an anti-blood cell antibody, and a blood cell condensing to the sample of whole blood, The phase in which mix a blood sample with (2) bridge-formation matter, and the bridge formation matter and the mixture of a blood sample are made to form, It is equipment which separates the liquid part of blood from the cell component of (3) blood. The pad made from the porous matter which can catch the cell component of the blood condensed by the reaction between the bridge formation matter and a blood sample although the liquid part of (a) blood was penetrated, the base which supports a (b) pad -- and -- The gap around the cell component of the blood by which (c) and (i) prehension was carried out is minded. From the pad made from (ii) porosity matter It comes to provide the means attached in the pad for promoting the flow of the liquid part of blood. To the equipment to which separation of the liquid part of the blood from the cell component of blood takes place by that cause by the flow which minds a pad without significant hemolysis In the phase and list which apply the bridge formation matter and the mixture of a blood sample It is the approach of coming to contain the phase of making the liquid part of (d) blood flowing through a pad, and separating the liquid part of blood from the cell component of blood.
Preferably, said approach includes further the phase of adding an anticoagulant with the bridge formation matter. Typically, an anticoagulant is heparin or EDTA.
The concentration of enough bridge formation matter to construct a bridge in all cell elements substantially [ blood ] preferably is used.
The option which separates the liquid part of blood from the cell component of blood (1) The phase of adding the sample of blood to the capillary tube covered with the above-mentioned bridge formation matter, The phase in which dissolve (2) bridge-formation matter in a blood sample, and the bridge formation matter and the mixture of a blood sample are made to form, (3) -- the phase which applies the bridge formation matter and the mixture of a blood sample to the equipment which separates the liquid part of blood from the cell component of blood as mentioned above -- and -- The liquid part of (4) blood is made to flow through a pad, and it comes to contain the phase of separating the liquid part of blood from the cell component of blood.
Preferably, the capillary tube is covered with the anticoagulant again.
Easy explanation of a drawing These and other descriptions, mode, and advantage of this invention will be better understood with reference to the claim of the following explanation and attachment, and the attached drawing.
Drawing 1 is a mimetic diagram of equipment which uses the pad made from the porous matter and which separates the liquid part of blood from the cell component of blood.
Drawing 2 is another mimetic diagram of the equipment shown in drawing 1 , and shows migration of the blood which passes along equipment.
Drawing 3 is the mimetic diagram of another embodiment of the assay equipment of this invention using the porous pad which has two sectors.
Drawing 4 is a mimetic diagram of another embodiment of equipment which separates the liquid part of blood from the cell component of the blood which uses three matrices.
Drawing 5 is a mimetic diagram of still more nearly another embodiment of the assay equipment of this invention which has the 2nd two matrix which may incorporate an assay element.
Drawing 6 is the mimetic diagram of the embodiment of the equipment which consists of two components of this invention.
Drawing 7 is the mimetic diagram of another embodiment of the equipment which consists of two components of this invention.
Drawing 8 is the explanatory view of the approach of this invention of separating the liquid part of

blood from the cell component of blood, this approach uses OFF-board separation and blood is added to the capillary tube containing the bridge formation matter to the cell component of blood.
Explanation Definition About this indication, unless it refuses, especially the following vocabulary is defined, as shown below. : Specific-binding partner: A pair of member of the molecule which interacts by the specific noncovalent interaction depending on the three-dimensional structure of the molecule which involves. A specific binding partner's typical pair contains an antigen-antibody, a hapten-antibody, a hormone receptor, a nucleic-acid strand-complementary nucleic-acid strand, a substrate-enzyme, a substrate analog-enzyme, an inhibitor-enzyme, carbohydrate-lectin, biotin-avidin, and a virus-cellular receptor.
Operational contact: The component of two solid-states touches operationally, capillarity or when contacting directly or indirectly so that it may flow without in addition to this interrupting an aquosity liquid from one side of two components substantially to another side more. Contact" means directly [ "] that two elements touch physically like an edge pair edge or an anterior part pair posterior part on a target. When two components contact directly typically, they lap in about 0.5mm - about 5mm lap. However, a component may be located so that an edge may be touched. Contact" means on him that the bridging is carried out with one or more conduction objects (guide), although two elements do not touch "indirectness target physically.
Analyte: The vocabulary "analyte" contains such an analog and a derivative, when combining another molecule by which an analog and a derivative are substantially used for the actual molecule list which should be authorized by assay by the equal approach with the analyte itself including the analog and derivative.
Antibody: The vocabulary "an antibody" shall contain in the antibody molecule as it is of suitable singularity, and the both pan of an antibody fragment (Fab, F (ab'), and F(ab')2 fragmentation is included) the hybrid antibody assembled by the reassociation besides the living body of the single-stranded antibody molecule and subunit which were built by gene engineering including the antibody molecule and antibody fragment as it is which were embellished chemically. Moreover, the anti-idiotype antibody which combines the antigen-bonding site of an antibody specifically is included in a definition.

:vocabulary "those significant without hemolysis" means that there is no hemolysis at those without significant hemolysis in extent the plasma or the blood serum obtained does not indicate clear red to be to a white background by the visual inspection.
supported : -- ** indirectly supported by the solid substrate through one or more mediation elements or it was directly supported [ vocabulary / "supported" ] by the solid substrate -- it includes having been supported directly or indirectly like.
Bridge-formation matter: The vocabulary "the bridge formation matter" is usually used here so that the matter which can construct a bridge, and can condense or (agglutinate) condense the cell component of blood (aggregate) may be included. These can make this vocabulary specifically condense as a lump by making a blood cell into adhesion including lectin, an anti-blood cell antibody, and a carbohydrate.
One of the two techniques into which the cell element (formed element) of blood is made to separate from the liquid part (the blood serum or plasma containing a fusibility element) of blood is used for the approach and equipment of this invention so that it may be used in an immunity chromatography test format.
The 1st of these techniques is activity-separation of the cell element of the blood from the liquid part of the blood on it as an one-part of test equipment generally called onboard processing. The 2nd of these techniques is processing or separation of the blood sample before the sample usually called off board processing is added to test equipment.
I. The equipment and the approach of onboard processing General explanation of A. onboard processing
One mode of this invention is equipment which is on test equipment or separates the liquid part of blood from the cell component of blood as an one-part. The cell component of blood contains an erythrocyte (erythroid cell), a leucocyte (leucocyte cell), and a platelet. Blood carries out the clot of blood of the liquid part of blood including the remaining part of blood, and when forming the clot containing a blood

cell and a fibrin, generally it is known as a blood serum. When obtained from the blood which has not carried out clot of blood, generally it is known as plasma. The main components which exist in plasma and do not exist in a blood serum are the precursors of a fibrinogen and a fibrin.
usually, such equipment Pad made from the porous matter which can catch the cell component of blood although the liquid part of (1) blood is penetrated The base and list which support (2) pads the surrounding gap of the cell component of the blood by which (3) and (i) prehension was carried out -- minding -- and (ii) --
In order to promote the flow of the liquid part of blood, it comes to provide the means attached in the pad from the pad made from the porous matter.
Usually, the method of separating the liquid part of blood from the cell component of the blood using this equipment The phase which applies the sample of (a) blood to the pad made from the porous matter of equipment, (b) blood sample is made to flow through the pad made from the porous matter. the phase into which the liquid part of a blood sample is made to separate from the cell component of a blood sample -- and -- The phase which promotes the flow of the liquid part of blood for the surrounding gap of the cell component of the blood by which (c) prehension was carried out from the pad made from a passage and the porous matter is included.
Although various kinds of arrangement and detailed finishing of this equipment are explained further below, these are the things of the pneuma of this invention within the limits.
Separation of the liquid part of the blood from the cell component of blood takes place by the flow which minds a pad without significant hemolysis.
Typically, a substrate is a flat substrate substantially [ of a solid-state ]. Typically, the flow which passes along a pad is produced in the direction which met the substrate in parallel substantially.
In order to promote the flow of the liquid part of blood, the means attached in the pad can contain the film for chromatography-separation in it, and, typically, the film has a prehension zone for combining the member of a specific binding pair on it. In this arrangement, equipment can be used by the approach of performing assay which detects and/or measures at least one analyte in the liquid part of a blood sample. This approach The phase which applies the sample of (1) blood to the pad made from the porous matter of equipment, Phase into which make (2) blood sample flow through the pad made from the porous matter, and the liquid part of a blood sample is made to separate from the cell component of a blood sample (3) as a result of an operation of the means attached in said pad The phase of passing along the surrounding gap of the cell component of the caught blood, and promoting the flow of the liquid part of blood, It reaches. The liquid part of (4) blood is made to flow through a chromatography medium, and assay is made to be performed in a chromatography medium. The assay It comes to contain the phase performed by combining the member of a specific binding pair with the prehension zone of a chromatography medium, and detecting and/or measuring said at least one analyte.
Time amount, optimum temperature, etc. of use of selection of the optimal conditions for implementation of such assay, for example, the member of a specific binding pair, a buffer, or a salt and a request are common knowledge, and it is not necessary to explain them further in this field, here.
A porous pad (although called a sample pad, the reason is that a sample is typically applied to it again) may be the mixture of these ingredients holding textile fabrics or a nonwoven fabric, paper, a cellulose, glass fiber, polyester, other polymers, or the cell component of blood. Typically, a porous pad includes the binder for the cell component of blood in it.
Typically, the binder for the cell component of blood is lectin or an anti-blood cell antibody. When a binder is an anti-blood cell antibody, typically, it is an anti-erythrocyte antibody. Such an antibody is common knowledge and it is not necessary to explain it further in this field, here. Typically, they are obtained by impregnation to the kind with which the fractions from an erythroid cell or an erythroid cell differ. If a desired antibody is an anti-human erythrocyte cellular antibody, a goat, a rabbit, a horse, and the sheep will be mentioned as a suitable animal for generation of such an antibody. Either poly clo NARU or a monoclonal antibody can be used. As an exception method, an anti-leucocyte or an antiplatelet antibody can use it independently, or, in addition to an anti-erythrocyte cellular antibody, can use, but it is the case where to ensure removal of these cell components is desired.

The binder for the cell component of blood is combined with a sample pad in noncovalent bond. Even if a bridge is constructed over it by the sample pad in share as an exception method, in this field, the technique which constructs a bridge to a solid base material, for example, a cellulose, paper, or other typical sample pad ingredients is common knowledge, and does not often need to explain :protein further here. The sample pad containing an antibody or lectin is Vogel. et In order to catch a cell element as indicated by U.S. Pat. No. 4,816,224 (it refers to and the publication is made with some specifications.) of al. etc., it may be further processed with a polyester binder. The polymer binder of other classes is also used.

When a binder is lectin, typically lectin :concanavalin A which is one of the following although not limited to this, One of the lectins produced by abrine, phytohemagglutinin, rim phosphorus, and the list by the following various kinds : AGARIKASU bis-PORASU (Agaricus bisporus), Anguilla Anguilla (Anguilla anguilla), ARACHISU HIPOGAEA (Arachis hvpogaea), bandy RAEA SIMM PURISHIFORIA (Bandeiraea simplicifolia), Bow HINIA par PUREA (Bauhinia purpurea), KARAGANA ABO loess sense (Caragana arborescens), SHISA ant ECHINAMU (Cicer arietinum), KOJIAMU FURAGIE (Codium fragile), DACHURA SUTORAMONIUMU (Datura stramonium), Dolichos biflorus BIFURORASU (Dolichos biflorus), ERICHIRINA colla tempestade RODENDORON (Ervthrina corallodendron), Erythrina coulisse TAGARI (Erythrina cristagalli), EUONIMASU Europa EASU (Euonymus europaeus), Glycine Max (Glycine max), helix ASUPASA (Helix aspersa), Helix POMASHIA (Helix pomatia), RASHIRASU ODORATASU (Lathyrus odoratus), RENSU chestnut NARISU (Lens culinaris), RIKOPA lithospermi radix S KURENTAMU (Lycopersicon esculentum), MAKURURA POMIFERA (Maclura pomifera), MOMOJIKA KARANSHIA (Momordica charantia), A mycoplasma GARISE petit cam (Mycoplasma gallisepticum), A NAJA MOKAMU beak (Najamocambique), NAJA KAOUCHIA (Naja kaouthia), Par SEAU Americana (Perseauamericana), FASEORASU KOSSHI news (Phaseolus coccineus), FASEORASU RIMENSHISU (Phaseolus limensis), FASEORASU BAL GARISU (Phaseolus vulgaris), FITO lacquer enamel Americana (Phytolacca americana), PISUMU SACHIBAMU (Pisum sativum), Pseudomonas AERUGINOSA (Pseudomonas aeruginosa), PUSOFOKAPUSU tetra-GONOROBUSU (Psophocarpus tetragonolobus), PUCHIROTA PURUMOSA (Ptilota plumosa), RISHINASU KOMYUNISU (Ricinus communis), A ROBINIA shoe door cassia (Robinia pseudoacacia), Sum bagasse NIGURA (Sambucus nigra), Solanum TSUBEROSAMU (Solanum tuberosum), The Sophora japonica (Sohora japonica), TETORAGO slag bus par PUREASU (Tetragonolobus purpureas), TORICHIKAMU BAL GARISU (Triticum vulgaris), Ulex Europa EASU (Ulex europaeus), BISHIA FABA (Vicia faba), BISHIA SACHIBA (Vicia sativa), BISHIA BIROSA (Vicia villosa), BIGUNA RAJIATA (Vigna radiata), a bis-cam album (Viscum album), and UISU terrier full cage BUNDA (Wisteria floribunda). Lectins are protein built by the animal and vegetation of a certain kind which are combined with the sugar machine which exists on the surface of a blood cell specifically and in un-sharing.

Preferably, lectin can combine both erythrocyte and leucocyte, and is not specific in a blood cell group. Many of other examples of lectins are known and it is not necessary to explain further here.

The pad made from the porous matter is Rapkin as an exception method. et The carbohydrate which may condense blood cells, such as a carbohydrate currently indicated by U.S. Pat. No. 4,678,575 (the publication is made with some specifications with reference to here) of al., may be infiltrated. :mannitol, sorbitol, inositol, beta-D-glucose, alpha-D-glucose, D (+) xylose, D (+) mannose, D (-) arabinose, L (+) arabinose, D (+) galactose, and L (-) xylose which is not what is limited to these although there are the following in these carbohydrates, D-GURUKO heptose, L-lixose, a lactose, a maltose, and a sucrose. Especially a desirable carbohydrate is a mannitol. Although an applicant does not mean being bound to this theory, these hydrocarbons act by joining together in noncovalent bond on the surface of an erythrocyte, and he is considered with making it condense whether an erythrocyte is solidified as adhesion.

With the application of the carbohydrate in a solution, a processed matrix is built with the concentration below 20% (w/v) to a penetrable matrix (for example, a cellulose, glass, or polyester etc.), for example, nonwoven fabric fiber. A solution is applied by various kinds of means, for example, sink in, printing, or

the spray so that desired concentration may be attained in a matrix. A carbohydrate acts as the hold-back agent which separates a cell from the surrounding liquid which moves freely in the inside of a matrix preferentially, a coagulum agent, or a flocculant.
The amounts of the separated blood are extent of adhesion between the means for promoting the flow of the absorbing power of the means attached in the pad for promoting the flow of the liquid part of blood from a pad through the surrounding gap of the cell component of the processed matrix, i.e., the caught blood, and the liquid part of the matrix and blood which were processed by the list, and the function of area.
B. Specific embodiment of an onboard processor One embodiment of the onboard processor of this invention The 1st porous separation matrix which can catch the cell component of blood although the liquid part of (1) blood is penetrated, It reaches. (2) It comes to provide the 2nd porous matrix in contact with the 1st porous separation matrix and actuation target which enables the liquid part of blood to flow without significant hemolysis according to capillary action or chromatography-separation through the 2nd porous matrix.
In this embodiment, the 2nd porous matrix comes to contain the means attached in the pad for promoting the flow of the liquid part of blood from the pad made from the porous matter through the surrounding gap of the cell component of the caught blood. The 2nd porous matrix may be the film, for example, may be the film suitable for chromatography-separation. As a typical ingredient of such film, although not limited to this, a nitrocellulose, a cellulose, other cellulosics, nylon, rayon, paper, a silica, polyester, and polysulfone are mentioned.
The usually desirable ingredient for such film is a nitrocellulose. A chromatography medium may be pretreated or reformed if needed.
The 2nd porous matrix can have on it the prehension zone which combines members of a specific binding pair, such as an antigen, haptens, or an antibody. For example, the 2nd porous matrix is fixed in a prehension zone, it can have the 1st antibody for combining analyte, and, subsequently this is detected by the means of the 2nd antibody of labeling in a sandwiches reaction. As an exception method, the 2nd porous matrix can have the antigen fixed in the prehension zone for combining an antibody. When many prehension zones may exist on the 2nd same porous matrix and more prehension zones than one exist rather than one, they can have two or more the same and different members of the specific binding pair combined with it. When more prehension zones than one exist, it may be used as contrast whose one prehension zone ensures that assay is performed suitably. In this field, many arrangement is common knowledge and does not need to indicate further. The 2nd porous matrix may follow, and may contain the chromatography assay element, and it is used for implementation of immunity chromatography assay. If the 2nd porous matrix is a chromatography assay element, equipment can carry out onboard separation of the cell component of blood, and assay about the analyte in the liquid part of the blood in single equipment from the liquid part of blood. Assay is carried out by reading a result next with the application of a blood sample to the 1st separation matrix.
Typically, a chromatography assay element performs contention immunoassay or sandwiches immunoassay as those formats are usually known for this field.
In the case of sandwiches immunoassay, typically, the component which was combined with the chromatography medium and which labeled is the antibody to analyte which labeled.
The component by which labeling was carried out when analyte itself was an antibody may be the 2nd antibody which combines the 1st antibody based on the singularity of a seed, a rope, or a subclass like [ in assay for detection of the antibody in the Homo sapiens blood serum to the bacteria HERIKO butter pylori (Helicobacter pylori) considered to be the causative agent of a gastric ulcer ].
Rope singularity is known again as isotype singularity of a Homo sapiens antibody, such as IgG, IgM, IgA, IgD, and IgE. Subclass singularity points out the difference of the antigen of the ropes, such as IgG1, IgG2, IgG3, IgG4, etc. which are the subclass of IgG. Combining with the fixed field of antibody analyte is greatly desirable so that the specific binding partner who is used for detection of antibody analyte and who labeled may prevent active jamming.
It is desirable to use indirect labeling for a certain application. For example, by the test of the Geer Gia

(Giardia) antigen, the IgM antibody for which labeling directly will probably be difficult is used. In that case, labeling of the 2nd specific specific binding partner is carried out to the 1st mobile specific binding partner. Typically, the 2nd specific binding partner by which labeling was carried out is combined with the antibody which is the 1st [ based on the singularity of a seed, a rope, or a subclass ] specific binding partner. The 1st specific binding partner has the specific binding affinity to analyte. As an exception method of use of the 2nd specific binding partner, the 1st specific binding partner is joined to a biotin, and an avidin-junction indicator can be used.

When contention immunoassay is performed, typically, an indicator is analyte or the analytes themselves. However, other labeling schemes are known for this field, and an indicator is the antibody to the 2nd specific binding partner or analyte which labeled in some of these labeling schemes. In a certain case, an anti-idiotype antibody is used by contention immunoassay.

One or more additional elements may intervene between the 1st porous separation matrix and the 2nd porous matrix. Typically, these elements are conductivity and can act as a pons between the 1st porous separation matrix and the 2nd porous matrix (namely, chromatography assay element).

The 2nd porous matrix has fixed preferably at arbitration to the base material of the solid-state which is nontransparent nature. The laminating of the 2nd porous matrix is carried out to a base material, or it is cast on it (cast). A solid base material can be built with ingredients, such as plastics or laminate paper.

Such equipment was shown in drawing 1 . Equipment 10 comes to provide the 1st porous separation matrix 12, the 2nd porous matrix 14 which touches the 1st porous separation matrix 12 operationally, and the solid base material 16. The 1st porous separation matrix 12 has the 1st front face 18 and 2nd front face 20. The 2nd porous matrix 14 may be a chromatography assay element.

After a blood sample 22 is added to the 1st front face 18 of the 1st porous separation matrix 12 and a cell element is caught in the 1st porous separation matrix 12 on the occasion of use, the liquid part of a blood sample 22 moves into the 2nd porous matrix 14 as a result of contact between the 2nd front face 20 of the 1st porous separation matrix 12, and the 2nd porous matrix 14. Chromatography assay is performed within the 2nd porous matrix 14.

Drawing 2 shows the equipment of drawing 1 after the liquid part of a blood sample moves into the 2nd porous matrix 14. The field shown by hatching made to cross among drawing 2 shows the area of the liquid flow which passes along the 1st porous matrix 12 and the 2nd porous matrix 14.

this operative condition -- with another gestalt [ like ], the 1st separation matrix may be the unsettled unsymmetrical film. The unsettled unsymmetrical film is constituted so that it may have the inclination to which pore size decreases within the film. The unsymmetrical film has the 1st front face and 2nd front face, and a blood sample is applied to the 1st front face. Pore size decreases from the 1st front face to the 2nd front face. The unsymmetrical film can catch the cell component of blood in it, and passes the liquid component of blood. The 1st separation matrix makes the liquid part of blood flow through contact to the 2nd matrix as mentioned above.

This equipment is also illustrated by the mimetic diagram of drawing 1 and drawing 2 , and has the 1st front face 18 and 2nd front face 20 of the unsymmetrical film as 1st porous separation matrix 12. The flow of blood is a thing from the 1st front face 18 to the 2nd front face 20 of the unsymmetrical film.

The unsymmetrical film suitable for using it for the onboard decollator of this invention is Koenhen. et U.S. Pat. No. 5,240,862 and Roesink of al. et It can prepare from the combination of a hydrophobic polymer and a hydrophilic polymer as indicated by U.S. Pat. No. 5,076,925 of al. A hydrophobic polymer may be polysulfone, polyether sulphone, polyimide, or polyether imide, and a hydrophilic polymer may be a polyvinyl pyrrolidone, polyacrylic acid, polyvinyl alcohol, polyvinyl acetate, or a polyethylene glycol.

It is constituted so that, as for the 1st matrix, some pads can combine the cell component of blood in the form of [ to the pan of this embodiment / another ] others. If a way of speaking is changed, the pad may be divided into two sectors, although the 1st sector makes flow possible, it cannot combine the cell component of blood, and the 2nd sector can combine the cell component of blood. The 2nd sector may also contain an antibody, lectin, or a hydrocarbon as mentioned above. Typically, the 1st sector contains the reagent for pretreatment of a blood sample which may be mixed beforehand in a blood sample, when

blood flows through the 1st sector.
Another format of this equipment was illustrated to drawing 3 . Equipment 40 has the 1st separation matrix 42 which has the 1st front face 44, the 2nd front face 46, and two sectors, and two sectors are the 2nd sector 50 which can combine the cell component of the 1st sector 48 which cannot combine the cell component of blood, and blood. Equipment has the 2nd porous matrix 52 and the solid base material 54 again.
On the occasion of use, the sample 56 of blood is added to the 1st front face 44 of the 1st separation matrix 42, the sample of blood moves to the 2nd sector 50 from the 1st sector 48, typically, a blood sample 56 is made to mix beforehand the reagent which exists in the 1st sector 48, and pretreatment of a blood sample 56 is made. Next, the liquid part of a blood sample 56 moves to the 2nd porous matrix 52 from the 2nd sector 50, and chromatography assay is performed in the 2nd porous matrix 52.
With another variant form to the pan of this embodiment The 1st porous separation matrix which can catch the cell component of blood although the liquid part of (1) blood is penetrated, The 2nd porous separation matrix in contact with the 1st porous separation matrix and actuation target which can catch the cell part of blood although the liquid part of (2) blood is penetrated, It reaches. (3) Three elements of the 3rd porous matrix in contact with the 2nd porous separation matrix and actuation target which enables the liquid part of blood to flow according to capillary action or chromatography-separation through the 2nd porous matrix are used.
Separation of the liquid part of the blood from the cell component of blood takes place by the flow which leads the 2nd porous separation matrix without significant hemolysis to the 1st.
In this variant form, the 3rd matrix includes the means for promoting the flow of the liquid part of blood from a passage and the 2nd matrix of (ii) for the surrounding gap of the cell component of the blood by which (i) prehension was carried out. The 3rd matrix may also contain a chromatography assay element. The 3rd matrix has fixed to the base material of an impermeable solid-state as mentioned above preferably at arbitration.
You may differ, even if the 1st and the 2nd matrix are the same, and any of the mode stated by above-mentioned section I (B) may also be included, and the matrix containing the binder to the cell component of blood, such as lectin or an anti-blood cell antibody, the matrix containing the hydrocarbon which can condense a blood cell, and the matrix containing the unsymmetrical film which catches a blood cell are mentioned to them. The matrix which has two sectors can be used.
The approach of separating the liquid part of blood from the cell component of blood, to this another mode of equipment The phase which applies the sample of (1) blood to the 1st porous separation matrix of equipment, (2) blood sample is made to flow through the 1st porous separation matrix and the 2nd porous separation matrix. the phase into which the liquid part of a blood sample is made to separate from the cell component of a blood sample -- and -- the surrounding gap of the cell component of the blood caught as a result of an operation of the (3) 3rd matrix -- a passage -- blood -- it shall come to contain the phase of promoting the flow of a liquid part
When the 3rd matrix contains the film for the chromatography-separation which has a prehension zone, The approach of performing assay which detects and/or measures at least one analyte in the liquid part of a blood sample The phase which applies the sample of (1) blood to the 1st porous separation matrix of equipment, (2) blood sample is made to flow through the 1st porous separation matrix and the 2nd porous separation matrix. Phase into which the liquid part of a blood sample is made to separate from the cell component of a blood sample As a result of an operation of the (3) 3rd matrix The phase of passing along the surrounding gap of the cell component of the caught blood, and promoting the flow of the liquid part of blood, It reaches. The liquid part of (4) blood is made to flow through the 3rd matrix. The phase which assay is made to be performed in the 2nd matrix, and is performed when assay combines the member of a specific binding pair with the prehension zone of the 3rd matrix and detects and/or measures said at least one analyte shall be included.
Deformation of this another mode of equipment was shown in drawing 4 . Equipment 60 has the 1st matrix 62, the 2nd matrix 64, the 3rd matrix 66, and the solid base material 68. The blood sample 70 applied to the 1st matrix 62 flows through the 1st matrix 62 and 2nd matrix 64, next moves the liquid

part of a blood sample into the 3rd matrix 66. Chromatography assay is performed in the 3rd matrix 66. this operative condition -- another voice to a pan [ like ] -- in deformation [ like ], equipment may also include many 2nd porous matrix and each 2nd porous matrix touches the 1st porous separation matrix and actuation target. Each 2nd porous matrix may also contain the chromatography assay element which has a prehension zone as mentioned above. When the 2nd porous matrix contains the chromatography assay element which has a prehension zone, The approach of performing assay which detects and/or measures at least one analyte in the liquid part of a blood sample The phase which applies the sample of (1) blood to the 1st porous separation matrix of equipment, Phase into which make (2) blood sample flow through the 1st porous separation matrix, and the liquid part of a blood sample is made to separate from the cell component of a blood sample As a result of an operation of the (3) 2nd matrix The phase of passing along the surrounding gap of the cell component of the caught blood, and promoting the flow of the liquid part of blood, It reaches. The liquid part of (4) blood is made to flow through the 2nd matrix. Assay is made to be performed within at least one of the 2nd matrix. The phase performed when assay combines the member of a specific binding pair with at least one prehension zone of the 2nd matrix and detects and/or measures said at least one analyte shall be included.

In one arrangement shown in drawing 5 , equipment touches each edge of the 1st porous matrix operationally including the 2nd two porous matrix. In this arrangement, blood is applied near the center of the 1st porous matrix, and moves toward an edge. As an exception method, the 2nd three or more porous matrices can be used, and each is contacted on the 1st porous matrix and actuation target. The 2nd porous matrix may be arranged around the 1st porous matrix like the spoke of a wheel. In this mode, any of the 1st above-mentioned porous matrix are sufficient as the 1st porous matrix, and it contains the unsettled unsymmetrical film.

Equipment 80 comes to provide the 2nd two matrices 92 and 94, in addition solid-state base material 96 in drawing 5 in the 1st porous separation matrix 82 and list which have the 1st front face 84, the 2nd front face 86, and the 1st and the 2nd edge 88 and 90. The 2nd two matrix 92 and 94 touches the edges 88 and 90 of the 1st porous separation matrix 82. It is added by the 1st front face 84 of the 1st porous separation matrix 82, and a blood sample 98 moves through the 1st porous separation matrix 82, and moves the liquid part of a blood sample into the 2nd two matrix 92 and 94.

C. Assay equipment which consists of two components Another embodiment of this invention is equipment which consists of two components which incorporated the 1st and the 2nd matrix. Such equipment is usual. (1) and (a) The 1st above porous separation matrix, It reaches. (b) The component including the 2nd porous matrix in contact with the 1st above porous separation matrix and above actuation target which can counter the 1st, In a list (2) The component in which the 1st and the 2nd opposite are possible is made to counter, and it comes to provide the component which can be attached in the component which a fluid is made to transport to another side from one side of the component which can counter by the pressure, and which can counter the 1st and which can counter the 2nd. There is an embodiment of a large number using the component in which two opposite is possible. Some modes were illustrated below by drawing 6 and 7. These modes, do not eliminate others, and have assay equipment of many formats, for example, are indicated by the coincidence connection United States patent application number 08th / No. 040 or 430 (with reference to here, the publication is made with some specifications.).

For example, the component which can counter the 2nd may also include a sample preparation zone, and this may also contain at least one reagent for processing of a sample. This reagent is used for processing of a sample, before separating the liquid part of blood from the cell component of blood.

As an exception method, a sample preparation zone may also contain the specific binding partner by whom labeling was done with the detectable indicator. A specific binding partner can have specific binding affinity to at least one component chosen from the specific binding partner and analyte to analyte of the gestalt which may be re-solubilized by addition of the aquosity sample to a sample preparation zone. If it puts in another way, a labeling eclipse ********** partner will be dried so that it may be applied to a sample preparation zone and may remelt with the gestalt of a liquid. Typically, when equipment is used for sandwiches immunoassay, the specific binding partner by whom labeling

was done with the detectable indicator has the specific binding affinity to analyte.
As an exception method, the component which can counter the 1st may also contain the specific binding partner by whom labeling was done with the indicator which can detect the gestalt which this sample preparation zone can re-solubilize, including a sample preparation zone further. When the sample preparation zone on the component which can counter the 1st makes an opposite location the component which can counter the 1st and the 2nd in this case, it is contacted with the element on the component which can counter the 2nd, so that it may describe below. This also hangs down migration of a sample, : Ranks second, and a sample and the specific binding partner by whom was re-solubilized and labeling was done are applied to a porous pad.
As an exception method, a porous pad may be on the component which counters from a chromatography medium with the equipment which consists of two components. The example of this arrangement was illustrated to following drawing 6 .
The approach of performing assay which detects and/or measures at least one analyte in the liquid part of a blood sample The phase which applies the sample of (1) blood to the 1st porous separation matrix on the component which the 1st can counter [ of the assay equipment which consists of two components ], Phase into which make (2) blood sample flow through the 1st porous separation matrix, and the liquid part of a blood sample is made to separate from the cell component of a blood sample As a result of an operation of the (3) 2nd matrix The phase of passing along the surrounding gap of the cell component of the caught blood, and promoting the flow of the liquid part of blood, (4) The phase of making the component in which the 1st and the 2nd opposite are possible countering, and making a fluid transporting to another side with a pressure from one side of the component which can counter, It reaches. The liquid part of (5) blood is made to flow through the 2nd matrix. The phase which assay is made to be performed in the 2nd matrix, and is performed when assay combines the member of a specific binding pair with the prehension zone of the 2nd matrix and detects and/or measures said at least one analyte shall be included.
Some examples of the assay equipment which consists of two components are shown.
One general arrangement was illustrated to drawing 6 . Assay equipment 200 has the component 202 which can counter the 1st, and the component 204 which can counter the 2nd. The component 202 which can counter the 1st contains the porous pad 206 for application of a sample. The component 204 which can counter the 2nd contains the chromatography medium 208. When the 1st and the components 202 and 204 which can counter the 2nd are made to counter the means for pulling out the liquid part of blood from the porous matter, it is formed of the lap between the porous pad 206 and the chromatography medium 208. The chromatography medium 208 can include the detection zone 210 and the contrast zone 212. The component 202 which can counter the 1st, and the component 204 which can counter the 2nd are connected by the hinge 214. The chromatography medium 208 is supported by the well 216. The component 202 which can counter the 1st can contain the apertures 218 for seeing the chromatography medium 208 including the field of the detection zone 210 and the contrast zone 212. Although the components 202 and 204 in which the 1st and the 2nd opposite are possible are formed of the edge 220 where it beveled on the component 202 which can counter the 1st, and the undercut edge 222 on the component 204 which can counter the 2nd, they may be held together by the engagement part [ like ]. The engagement part of other formats can also be used. Equipment can be accessed by the notch 224 formed in the component 204 which can counter the 2nd.
Another embodiment of the assay equipment of this invention contains the equipment which can perform the 2 direction chromatography. This embodiment was illustrated to drawing 7 . Assay equipment 300 has the component 302 which can counter the 1st, and the component 304 which can counter the 2nd. The component 302 which can counter the 1st contains the absorber 306 and applicator 308 who may be an absorbent pad. The component 304 which can counter the 2nd has the chromatography medium 310 which has the 1st edge 312 and 2nd edge 314, and has the detection zone 316 and the contrast zone 318. The component 304 which can counter the 2nd has the conduction object 320 which touches the 2nd edge 314 of the chromatography medium 310 operationally again, and the conduction object 320 is used for applying an applicator's 308 reagent to the chromatography medium

310 when the 1st and the components 302 and 304 which can counter the 2nd are made into an opposite location. Although the component 304 which can counter the 2nd penetrates the liquid part of blood as mentioned above again, it has the pad 322 made from the porous matter which can catch the cell component of blood. The pad 322 made from the porous matter touches the 1st edge 312 of the chromatography medium 310 operationally, and forms a means for this operational contact to pull out the liquid part of blood from the pad 322 made from the porous matter. The components 302 and 304 in which the 1st and the 2nd opposite are possible are connected by the hinge 324. The pad 322 of the chromatography medium 310 and the product made from the porous matter is supported by the well 326. The component 302 which can counter the 1st can contain the aperture 328 for seeing the chromatography medium 310 including the field of the detection zone 316 and the contrast zone 318. Although the components 302 and 304 in which the 1st and the 2nd opposite are possible are formed of the beveling edge 330 on the component 302 which can counter the 1st, and the undercut edge 332 on the component 304 which can counter the 2nd, they can be held together by the engagement part [ like ]. The engagement part of other formats can also be used. Equipment can be accessed by the notch 334 formed in the component 304 which can counter the 2nd.

On the occasion of use, it is applied to the porous pad 322 with which a blood sample separates the cell component of blood. Subsequently, the liquid part of a blood sample moves through the chromatography medium 310, if the 1st and the components 302 and 304 which can counter the 2nd are made to counter at the time, an applicator's 308 reagent will be applied to the chromatography medium 310, it moves through the chromatography medium 310 in a direction opposite to the flow of the liquid part of the blood sample which passes along the chromatography medium 310, and flow is reversed. The inversion of flow is pushed by the absorber 306.

This embodiment is suitable for especially the implementation of serological verification that detects the antibody in a blood sample. For example, if the analyte which should be detected is a Homo sapiens antibody to bacteria Helicobacter Pylori (Helicobacter pylori) considered to be the cause of a gastric ulcer, the blood sample it was suspected to be that an antibody was included can be applied to the porous pad 322, and the cell component of blood will be separated from the liquid part of a blood sample. Subsequently, the liquid part of a blood sample moves to the chromatography medium 310 from the porous pad 322. Since the detection zone 316 can contain fixed H. pylori (H. pylori) antigen, it combines any specific antibody with H. pylori antigen in a detection zone. An applicator 308 contains the antibody which combines a Homo sapiens immunoglobulin G antibody and which carried out labeling, for example, the goat anti-Homo sapiens immunoglobulin G antibody which carried out labeling withgold, with the gestalt in which re-solubilization is possible. An applicator's 308 contents are remelted by addition of the aquosity liquid to an applicator 308. If the components 302 and 304 in which the 1st and the 2nd opposite are possible are made to counter, an applicator 308 will be contacted to the chromatography medium 310, and the anti-human IgG antibody by which labeling was carried out will be applied to the chromatography medium 310. Subsequently, an absorber 306 moves the anti-human IgG antibody by which labeling was carried out through the chromatography medium 310 in a direction opposite to the flow of the liquid part of the blood sample which passes along the chromatography medium 310. Subsequently, labeling of the anti-H. pylori antibody combined in the detection zone 316 is carried out. Use of the antibody by which labeling was carried out withgold detects existence of anti-H. pylori antibody visually. This reverse flow pushed by the absorber 306 is not specific to H. pylori antigen, and although not combined with the detection zone 316, it acts as a penetrant remover which removes other antibodies which exist in the sample which will react with the anti-human IgG antibody by which labeling was carried out, and will give the background. Therefore, use of the flow of two directions decreases a background and increases the sensibility and dependability of a test.

These arrangement, it does not restrict to these, and other arrangement of the one direction assay equipment of this invention which incorporated the porous pad which combines the cell component of blood, and the 2 direction assay equipment enters within the limits of this invention. These arrangement can contain many elements.

For example, with much equipments of this invention, it is operationally in contact with the edge where

the edge where the absorber touches the end section of a chromatography medium and the pad of the product made from the porous matter typically is opposite. It is made of the ingredient of the absorptivity which can fully hold a liquid, a liquid is lengthened through a chromatography medium, and an absorber is accumulated in an absorber.
As a typical ingredient of an absorber, although filter paper is mentioned, it is not limited to this. Furthermore, equipment may also contain one or more conduction objects. A conduction object plays the role of the pons between the pad made from the porous matter, and a chromatography medium, and constitutes the means which pulls out the liquid part of blood from porous matter. These conduction objects are prepared from the hydrophilic medium which lets a liquid pass, without absorbing a liquid substantially. Such matter is common knowledge in this field. A cellulose and a cellulosic are used.
With the equipment of this invention using the component which can counter, since the body of the component which can counter contains the liquid which participates in implementation of the assay performed by equipment preferably, it is built with the laminating pasteboard which is fully impermeability to moisture. The sulfite (SBS) by which other cellulose base ingredients, for example, the paper board, or a solid-state was bleached can also be used. As an exception method, the body of the component which can counter may be built with the plastics which does not let moisture pass. Suitable plastics is a polycarbonate plastic like LexanTM.
The component which can counter is connected by the hinge made from plastics which can be preferably connected with the ingredient, both [ for example, / both the 1st and the components which can counter the 2nd ], which does not let a liquid pass with a hinge, or the same hinge made from plastics as the 1st and the ingredient used for the component which can counter the 2nd.
Format of being suitable for especially implementation of 2 direction assays The 1st porous separation matrix which can catch the cell component of blood although the liquid part of (1) and (a) blood is penetrated, It reaches. (b) The 2nd porous matrix is minded. According to capillary action or chromatography-separation The component including the 2nd porous matrix containing the film for the chromatography-separation in contact with the 1st porous separation matrix and actuation target which enables the liquid part of blood to flow in the 1st direction which can counter the 1st, In a list (2) Make the component in which the 1st and the 2nd opposite are possible counter, and a reagent is made to transport to the component which can counter the 1st with a pressure from the component which can counter the 2nd. Making the component in which the 1st and the 2nd opposite are possible counter the reagent transported to the component which can counter the 1st from the component which can counter the 2nd The component which can be attached in the component which is made to shift through the 2nd porous matrix in the 2nd direction opposite to the 1st direction, and which can counter the 1st and which can counter the 2nd shall be included.
The reagent which the film for chromatography-separation included typically the prehension zone which combines analyte in it in this format, and was transported to the component which can counter the 1st from the component which can counter the 2nd is the specific binding partner labeled for analyte.
The approach of performing assay for detecting and/or measuring at least one analyte in the liquid part of a blood sample using this mode The phase which applies the sample of (1) blood to the 1st porous separation matrix on the component which the 1st can counter [ of equipment ], (2) blood sample is made to flow through the 1st porous separation matrix. The phase into which the liquid part of a blood sample is made to separate from the cell component of a blood sample, The phase of making the liquid part of (3) blood sample flowing through the film for chromatography-separation in the 1st direction, (4) The phase of moving with a pressure the specific binding partner to whom the component in which the 1st and the 2nd opposite are possible was made countering, and labeling of [ for analyte ] was carried out to the component which can counter the 1st from the component which can counter the 2nd, It reaches. The specific binding partner to whom labeling of [ for (5) analytes ] was carried out is made to flow through the film for chromatography analysis in the 2nd direction. The phase performed by assay being made to be performed in the 2nd matrix, combining with the prehension zone of the 2nd matrix the specific binding partner by whom labeling was done in assay, and detecting and/or measuring said at least one analyte shall be included.

Explanation of above equipment is related with the assay equipment which performs one assay at once. However, the assay equipment of this invention is constituted again also so that a large number may be authorized at once.
The assays of two or more are performed to the same analyte or two or more different analytes.
This makes it possible to apply many blood samples to one equipment, and to make a large number authorize.
The equipment and the approach for II. OFF-board processing Another mode of this invention is the method of separating the liquid part of blood from the cell component of blood of performing adding the binder to the cell part of blood beforehand to the sample of whole blood before the mixture is applied to the equipment which separates the liquid part of blood from the cell component of blood.
Such one approach The phase of adding the bridge formation matter to the cell component of the blood which is the bridge formation matter chosen from the group which consists of a carbohydrate which can make (1) lectin, an anti-blood cell antibody, and a blood cell condensing to the sample of whole blood, Mix a blood sample with (2) bridge-formation matter, and the bridge formation matter and the mixture of a blood sample are made to form. Or phase which carries out time amount neglect where mixing takes place It is equipment which separates the liquid part of blood from the cell component of (3) blood. The pad made from the porous matter which can catch the cell component of the blood condensed by the reaction between the bridge formation matter and a blood sample although the liquid part of (a) blood was penetrated, the base which supports a (b) pad -- and -- The gap around the cell component of the blood by which (c) and (i) prehension was carried out is minded. From the pad made from (ii) porosity matter Were attached in the pad for promoting the flow of the liquid part of blood. In the phase and list which apply the bridge formation matter and the mixture of a blood sample to the equipment possessing a means The liquid part of (4) blood shall be made to flow through a pad, and the phase of separating the liquid part of the blood from the cell component of blood shall be included.
Separation of the liquid part of the blood from the cell component of the blood combined with the binder takes place by the flow which minds a pad without significant hemolysis. As for this approach, the pad made from the porous matter does not need to contain the bridge formation matter, for example, an antibody, or lectin, rather, a pad acts as a filter, the cell component of the blood condensed by combining with the bridge formation matter beforehand is removed, and it differs from the above-mentioned approach in that association takes place before a sample is applied to a pad.
Preferably, an anticoagulant is added with the bridge formation matter. Although a typical anticoagulant is EDTA or heparin, other anticoagulants are well-known in this field.
Preferably, it is substantially used for the concentration of the bridge formation matter for the cell element of all blood, making it into sufficient concentration to construct a bridge.
the voice which explained the equipment which separates the liquid part of blood from the cell component of blood with the above-mentioned section I -- although any [ like ] are sufficient -- the pad made from the porous matter -- a cell component -- condensation or the means which carries out clot of blood -- not giving -- blood -- already -- having condensed -- or clot of blood -- it differs in that it acts as a filter from which the cell component carried out is removed.
The liquid part from which blood was separated is typically authorized to analyte by the immunity chromatography procedure next as mentioned above. If the equipment used in order to separate the liquid part of blood from the cell component of blood contains a chromatography medium as mentioned above, assay can be performed within equipment and this will usually be desirable. In other cases, the liquid part from which blood was separated can be taken out for assay with another equipment.
"Chromatography assay equipment [ which has the element which can counter ]" These assays are Howard of the becoming name. M. Chandler et It can carry out with assay equipment like the equipment indicated by the coincidence connection United States patent application 08th by al. / No. 040 or 430 (the publication is made with some specifications with reference to here.). These equipments contain both 2 direction assay equipment and one direction assay equipment.
As an exception method, you may add to the capillary tube which covered the sample of blood without the anticoagulant with the bridge formation matter together with the clot-of-blood matter instead of

adding the bridge formation matter to the sample of whole blood. the bridge formation matter -- and if it is, it is made to dissolve an anticoagulant subsequently to a blood sample Subsequently the blood sample which dissolved the bridge formation matter and an anticoagulant into it is applied to the equipment which separates the liquid part of blood from the cell component of blood as mentioned above. Also in this case, equipment was made to condense or acts as a filter to the blood cell which carried out clot of blood. Assay can be performed as mentioned above.

Generally this mode was illustrated to drawing 8 . A blood sample 400 is added to a capillary tube 402, and applies a capillary tube to a decollator 404 after mixing.

Advantage of invention This invention offers a quick and efficient and simple means to separate a blood cell from the liquid part of blood for carrying out specific joint assay, for example, immunoassay, and other tests. Especially this invention offers the one-equipment which incorporated both of the means for separating the liquid part of blood from an assay element and the cell component of blood so that the analyte which exists in the liquid part of blood may be authorized quickly. This avoids that the blood serum from the blood accompanied by the intentional necessity of safe disposal of blood fractionation or plasma needs to be preliminary extracted. Use of the assay equipment of this invention enables safe disposal for the convenience of used test equipment. In addition, this improved equipment enables direct assay of desired analyte, when applying a whole blood sample to equipment.

The assay equipment of this invention can perform wide range immunoassay including both sandwiches immunoassay and contention immunoassay. Especially the assay equipment of this invention fits detection and/or measurement of both antigen and antibody.

Although this invention was considerably explained to the detail about the desirable gestalt of the some, other gestalten and embodiments are also possible. These gestalten include other arrangement of the equipment which consists of two components which operate by the basal principle explained here. These gestalten contain the assay equipment which suits the contention immunoassay and sandwiches immunoassay of various arrangement. Especially the equipment of this invention suits using rather the flow of linear not flowing but radial [ which pass along a chromatography medium ], or a circumferencial direction. Or it has arranged the equipment of this invention in circular, it can also suit authorizing a large number to coincidence using the 2nd porous matrix of a large number which have arranged like the spoke of a wheel or carried out other arrangement. Although the equipment of this invention fits especially the thing for which separating the liquid part of blood from the cell component of blood and assay about the liquid part of blood are performed, the equipment of this invention can be used also in order to remove a blood cell, other body fluid, for example, cerebrospinal fluid, which may contain a blood cell, and is applicable also to assay of such body fluid after removal of a blood cell. The equipment of this invention can also suit implementation of other assays, for example, enzyme assay, and colorimetry assay again.

This invention also includes further the gestalt mixed by the fastener of the electric force, the magnetic force or a hook, and the cloth (VelcroTM) TM with a through ring, for example, Velcro etc., which can be removed, in order not to hold two components of equipment by the arrangement fixed eternally, and to be able to dissociate and to authorize. In addition, this invention also includes the equipment which has three components which took folding arrangement. Therefore, the range of this invention is appointed by the following claim.

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[Translation done.]

* NOTICES *



1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

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CLAIMS

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[Claim(s)]
1. Equipment Which Separates Liquid Part of Blood from Cell Component of Blood -- it is -- Pad made from Porous Matter Which Can Catch Cell Component of Blood although Liquid Part of (a) Blood is Penetrated Base Which Supports (B) Pad -- and -- Surrounding Gap of Cell Component of Blood by Which (C) and (I) Prehension was Carried Out -- Minding -- and (Ii) --
It comes to provide the means attached in the pad for promoting the flow of the liquid part of blood from the pad made from the porous matter. Equipment to which separation of the liquid part of the blood from the cell component of blood takes place by that cause by the flow which minds a pad without significant hemolysis.
2. Equipment according to claim 1 with which pad made from porous matter comes to contain binder to cell component of blood.
3. Equipment according to claim 1 into which it sinks with carbohydrate with which pad can condense blood cell.
4. the pad made from the porous matter -- two sectors: the 1st sector which penetrates both liquid part of (i) blood, and cell component of blood -- and -- Equipment according to claim 1 which comes to contain the 2nd sector which can combine the cell component of blood although the liquid part of (ii) blood is penetrated.
5. Although Liquid Part of Blood is Penetrated The pad made from the porous matter which can catch the cell component of blood comes in it to contain the unsymmetrical film which has the 1st front face and 2nd front face. Said film It is equipment according to claim 1 which it has [ equipment ] the inclination of pore size so that it may apply to the 2nd front face from the 1st front face and pore size may become small, and said unsymmetrical film can catch [ equipment ] the cell component of blood in it, and passes the liquid component of blood.
6. Equipment according to claim 1 with which means attached in pad for promoting flow of liquid part of blood comes to contain film for chromatography-separation in it.
7. It is Equipment Which Separates Liquid Part of Blood from Cell Component of Blood. 1st Porous Separation Matrix Which Can Catch Cell Component of Blood although Liquid Part of (a) Blood is Penetrated, It reaches. (b) It comes to provide the 2nd porous matrix in contact with the 1st porous separation matrix and actuation target which enables the liquid part of blood to flow according to capillary action or chromatography-separation through the 2nd porous matrix. By that cause Equipment to which separation of the liquid part of the blood from the cell component of blood takes place by the flow which led the 2nd matrix without significant hemolysis to the 1st.
8. It is Equipment Which Separates Liquid Part of Blood from Cell Component of Blood. 1st Porous Separation Matrix Which Can Catch Cell Component of Blood although Liquid Part of (a) Blood is Penetrated, The 2nd porous separation matrix in contact with the 1st porous separation matrix and actuation target which can catch the cell part of blood although the liquid part of (b) blood is penetrated, It reaches. (c) It comes to provide the 3rd porous matrix in contact with the 2nd porous separation matrix and actuation target which enables the liquid part of blood to flow according to capillary action or

chromatography-separation through the 2nd porous matrix. By that cause Equipment to which separation of the liquid part of the blood from the cell component of blood takes place by the flow which led the 2nd porous separation matrix without significant hemolysis to the 1st.
9. Equipment according to claim 8 with which both the 1st porous matrix, the 2nd porous matrix or 1st porous matrix, and 2nd porous matrix come to contain binder to cell component of blood.
10. Equipment according to claim 8 into which it sinks with the carbohydrate with which both the 1st porous matrix, the 2nd porous matrix or 1st porous matrix, and 2nd porous matrix can condense a blood cell.
11. both the 1st porous matrix, the 2nd porous matrix or 1st porous matrix, and 2nd porous matrix -- two sectors: the 1st sector which penetrates both liquid part of (i) blood, and cell component of blood -- and -- Equipment according to claim 8 which comes to contain the 2nd sector which can combine the cell component of blood although the liquid part of (ii) blood is penetrated.
12. Both 1st Porous Matrix, 2nd Porous Matrix or 1st Porous Matrix, and 2nd Porous Matrix It is the unsymmetrical film which has the 1st front face and 2nd front face. Said film It is equipment according to claim 8 which it has [ equipment ] the inclination of pore size so that it may apply to the 2nd front face from the 1st front face and pore size may become small, and said unsymmetrical film can catch [ equipment ] the cell component of blood in it, and passes the liquid component of blood.
13. Equipment according to claim 8 with which the 3rd matrix contains the film for chromatography-separation.
14. It is Equipment Which Separates Liquid Part of Blood from Cell Component of Blood. The 1st porous separation matrix which can catch the cell component of blood although the liquid part of (a) blood is penetrated, It reaches. (b) Each 2nd porous matrix minds the 2nd porous matrix. According to capillary action or chromatography-separation It comes to provide 2nd at least two porous matrix in contact with the 1st porous separation matrix and actuation target which enables the liquid part of blood to flow. Equipment to which separation of the liquid part of the blood from the cell component of blood takes place by that cause by the flow which minded the 1st and the 2nd matrix without significant hemolysis.
15. Equipment of claim 14 with which the 2nd matrix contains the film for chromatography-separation, respectively.
16. It is Equipment Which Separates Liquid Part of Blood from Cell Component of Blood. The 1st porous separation matrix which can catch the cell component of blood although the liquid part of (a) and (i) blood is penetrated, It reaches. (ii) The component including the 2nd porous matrix in contact with the 1st porous separation matrix and actuation target which enables the liquid part of blood to flow according to capillary action or chromatography-separation through the 2nd porous matrix which can counter the 1st, In a list (b) As [ transport / make the component in which the 1st and the 2nd opposite are possible counter, and / from one side of the component which can counter / with a pressure / to another side / a fluid ] Equipment which happens by the flow came to provide the component which can be attached in the component which can counter the 1st, and which can counter the 2nd, and separation of the liquid part of the blood from the cell component of blood minded the 1st and the 2nd matrix of the component which can counter the 1st without significant hemolysis by that cause.
17. Equipment of claim 16 with which the component which can counter the 2nd includes a sample preparation zone.
18. Said specific binding partner is equipment according to claim 17 which has binding affinity specific for at least one component chosen from the specific binding partner and analyte to the analyte which is the gestalt in which re-solubilization is possible by addition of the aquosity sample to a sample preparation zone including the specific binding partner to whom the indicator of the sample preparation zone was carried out with the detectable indicator.
19. Said specific binding partner is equipment according to claim 16 with which it has binding affinity specific for at least one component chosen from the specific binding partner and analyte to the analyte which is the gestalt in which re-solubilization is possible by addition of the aquosity sample to a sample preparation zone coming [ a sample preparation zone including the specific binding partner by whom the

indicator was done with the indicator which at least one of the components in which the 1st and the 2nd opposite are possible can detect ] further.
20. It is Equipment Which Separates Liquid Part of Blood from Cell Component of Blood. The 1st porous separation matrix which can catch the cell component of blood although the liquid part of (a) and (i) blood is penetrated, It reaches. (ii) The 2nd porous matrix is minded. According to capillary action or chromatography-separation The component including the 2nd porous matrix containing the film for the chromatography-separation in contact with the 1st porous separation matrix and actuation target which enables the liquid part of blood to flow in the 1st direction which can counter the 1st, In a list (b) Make the component in which the 1st and the 2nd opposite are possible counter, and a reagent is transported to the component which can counter the 1st with a pressure from the component which can counter the 2nd. Making the component in which the 1st and the 2nd opposite are possible counter so that the reagent transported to the component which can counter the 1st may be made to migrate through the 2nd porous matrix in the 2nd direction opposite to the 1st direction from the component which can counter the 2nd It comes to provide the component which can be attached in the component which can counter the 1st and which can counter the 2nd. Equipment to which separation of the liquid part of the blood from the cell component of blood takes place by that cause by the flow which led the 1st and the 2nd matrix of the component which can counter the 1st without significant hemolysis.
21. Equipment according to claim 20 whose reagent with which the film for chromatography-separation included in it the prehension zone which combines analyte, and was transported to the component which can counter the 1st from the component which can counter the 2nd is the specific binding partner to analyte by whom the indicator was done.
22. Equipment given in either of claims 7, 14, or 16 in which the 1st porous separation matrix contains the binder to the cell component of blood.
23. Equipment given in either of claims 2, 9, or 22 whose binders are anti-blood cell antibodies.
24. Equipment according to claim 23 whose anti-blood cell antibody is an anti-erythrocyte antibody.
25. Equipment given in either of claims 2, 9, or 22 whose binders are lectin.
Lectin 26. Concanavalin A, Abrine, Phytohemagglutinin, In rim phosphorus and a list, various following :AGARIKASU bis-PORASU, Anguilla Anguilla, ARACHISU HIPOGAEA, bandy RAEA SIMM PURISHIFORIA, bow HINIA par PUREA, KARAGANA ABO loess sense, SHISA ant ECHINAMU, KOJIAMU FURAGIE, DACHURA SUTORAMONIUMU, Dolichos biflorus BIFURORASU, ERICHIRINA colla tempestade RODENDORON, Erythrina coulisse TAGARI, EUONIMASU Europa EASU, glycine Max, Helix ASUPASA, helix POMASHIA, RASHIRASU ODORATASU, RENSU chestnut NARISU, RIKOPA lithospermi radix S KURENTAMU, MAKURURA POMIFERA, MOMOJIKA KARANSHIA, a mycoplasma GARISE petit cam, a NAJA MOKAMU beak, NAJA KAOUCHIA, par SEAU Americana, FASEORASU KOSSHI news, FASEORASU RIMENSHISU, FASEORASU BAL GARISU, FITO lacquer enamel Americana, PISUMU SACHIBAMU, Pseudomonas AERUGINOSA, PUSOFOKAPUSU tetra-GONOROBUSU, PUCHIROTA PURUMOSA, RISHINASU KOMYUNISU, a ROBINIA shoe door cassia, Sum bagasse NIGURA, Solanum TSUBEROSAMU, the Sophora japonica, TETORAGO slag bus par PUREASU, TORICHIKAMU BAL GARISU, Ulex Europa EASU, Equipment according to claim 25 chosen from the group which consists of lectins produced by BISHIA FUBA, BISHIA SACHIBA, BISHIA BIROSA, BIGUNA RAJIATA, a bis-cam album, and UISU terrier full cage BUNDA.
27. Equipment given in either of claims 7, 14, or 16 into which it sinks with the carbohydrate with which the 1st porous separation matrix can condense a blood cell.
28. Carbohydrate -- Mannitol, Sorbitol, Inositol, Beta-D-Glucose, Alpha-D-Glucose, D (+) Xylose, D (+) Mannose, D (-) Arabinose, L (+) Arabinose, D (+) Galactose, and L (-)
Equipment given in either of claims 3, 10, or 27 chosen from the group which consists of a xylose, D-GURUKO heptose, L-lixose, a lactose, a maltose, and a sucrose.
29. Equipment according to claim 28 whose carbohydrate is a mannitol.
30. Equipment given in either of claims 7 or 16 to which the 2nd matrix comes to contain the film for chromatography-separation.

31. Equipment given in either of claims 6, 13, 15, or 30 which have on it the prehension zone where the film for chromatography-separation combines the member of a specific binding pair.
32. It is equipment given in either of claims 7 or 16 which the 1st separation matrix is [ claims ] the unsymmetrical film which has the 1st front face and 2nd front face, it has [ claims ] the inclination of pore size so that said film may be covered over the 2nd front face from the 1st front face and pore size may become small, and said unsymmetrical film can catch [ claims ] the cell component of blood in it, and pass the liquid component of blood.
33. the 1st separation matrix -- two sectors: the 1st sector which penetrates both liquid part of (i) blood, and cell component of blood -- and -- Equipment given in either of claims 7 or 16 which come to contain the 2nd sector which can combine the cell component of blood although the liquid part of (ii) blood is penetrated.
34. It is Approach of Separating Liquid Part of Blood from Cell Component of Blood. The phase of adding the bridge formation matter to the cell component of the blood which is the bridge formation matter chosen from the group which consists of (a) lectin, an anti-blood cell antibody, and a carbohydrate that can make a blood cell condensing to the sample of whole blood, The phase in which mix a blood sample with (b) bridge formation matter, and the bridge formation matter and the mixture of a blood sample are made to form, It is equipment which separates the liquid part of blood from the cell component of (c) blood. The pad made from the porous matter which can catch the cell component of the blood condensed by the reaction between the bridge formation matter and a blood sample although the liquid part of (i) blood was penetrated, the base which supports a (ii) pad -- and -- (iii) The gap around the cell component of the blood by which (1) prehension was carried out is minded. From the pad made from (2) porosity matter It comes to provide the means attached in the pad for promoting the flow of the liquid part of blood. To the equipment to which separation of the liquid part of the blood from the cell component of blood takes place by that cause by the flow which minded the pad without significant hemolysis In the phase and list which apply the bridge formation matter and the mixture of a blood sample How to come to contain the phase of making the liquid part of (d) blood flowing through a pad, and separating the liquid part of blood from the cell component of blood.
35. The approach according to claim 34 of including adding an anticoagulant with the bridge formation matter further.
36. It is Approach to Separate Liquid Part of Blood from Cell Component of Blood. The phase of adding the sample of blood to the capillary tube covered with the bridge formation matter which is bridge formation matter chosen from the group which consists of (a) lectin, an anti-blood cell antibody, and a carbohydrate that can make a blood cell condensing, The phase in which dissolve (b) bridge formation matter in a blood sample, and the bridge formation matter and the mixture of a blood sample are made to form, It is equipment which separates the liquid part of blood from the cell component of (c) blood. The pad made from the porous matter which can catch the cell component of the blood condensed by the reaction between the bridge formation matter and a blood sample although the liquid part of (i) blood was penetrated, the base which supports a (ii) pad -- and -- (iii) The gap around the cell component of the blood by which (1) prehension was carried out is minded. From the pad made from (2) porosity matter It comes to provide the means attached in the pad for promoting the flow of the liquid part of blood. To the equipment to which separation of the liquid part of the blood from the cell component of blood takes place by that cause by the flow which minded the pad without significant hemolysis In the phase and list which apply the bridge formation matter and the mixture of a blood sample How to come to contain the phase of making the liquid part of (d) blood flowing through a pad, and separating the liquid part of blood from the cell component of blood.
37. The approach according to claim 36 by which the capillary tube is covered also with the anticoagulant with the bridge formation matter, and the anticoagulant is dissolved into the blood sample.

38. An approach given in either of claims 35 or 37 chosen from the group which an anticoagulant becomes from EDTA and heparin.
39. One approach of claims 34 or 36 that come out of all cell elements to constructing a bridge enough

substantially [ blood ], and the concentration of a certain bridge formation matter is used.

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[Translation done.]

* NOTICES *



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DRAWINGS

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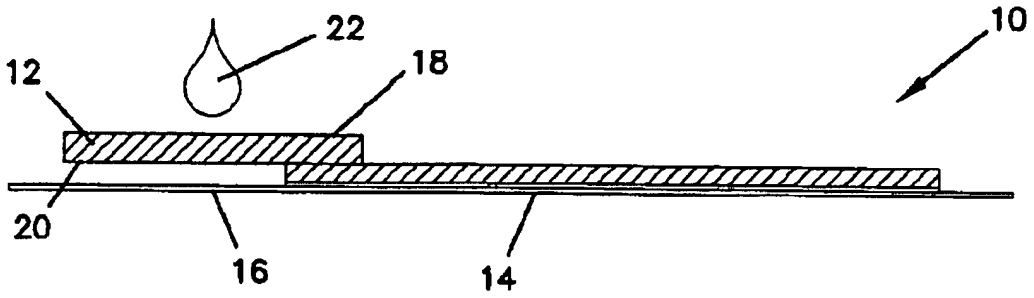
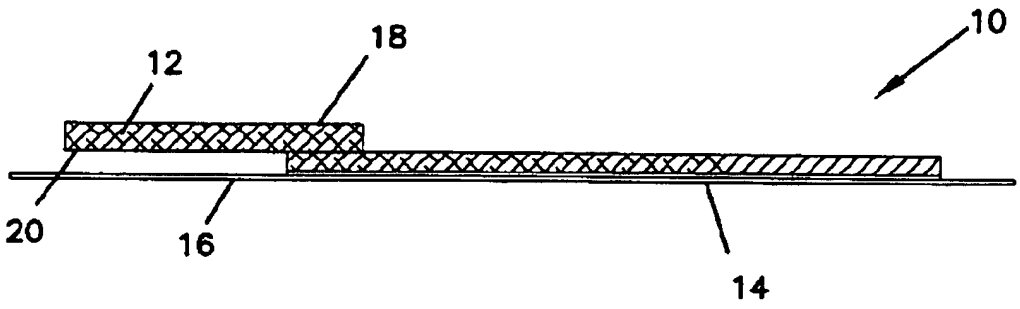
[Drawing 1]
FIG. 1

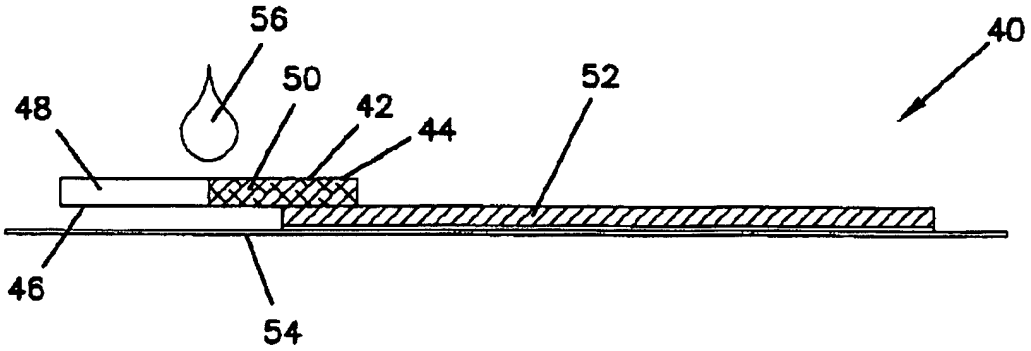



[Drawing 2]
FIG. 2



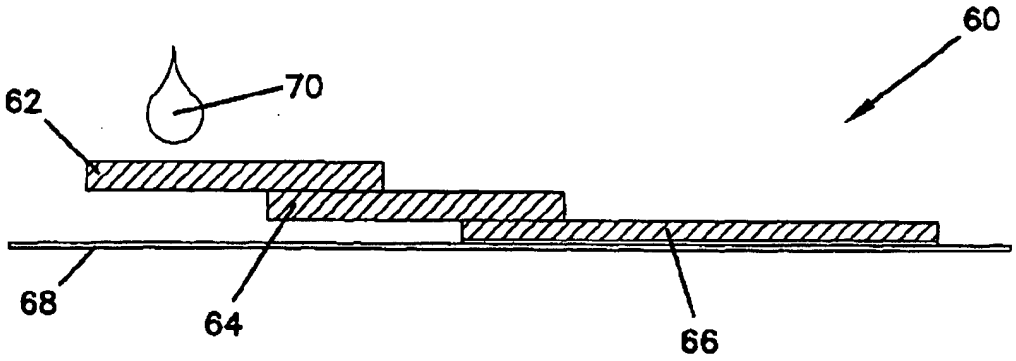

[Drawing 3]

FIG. 3



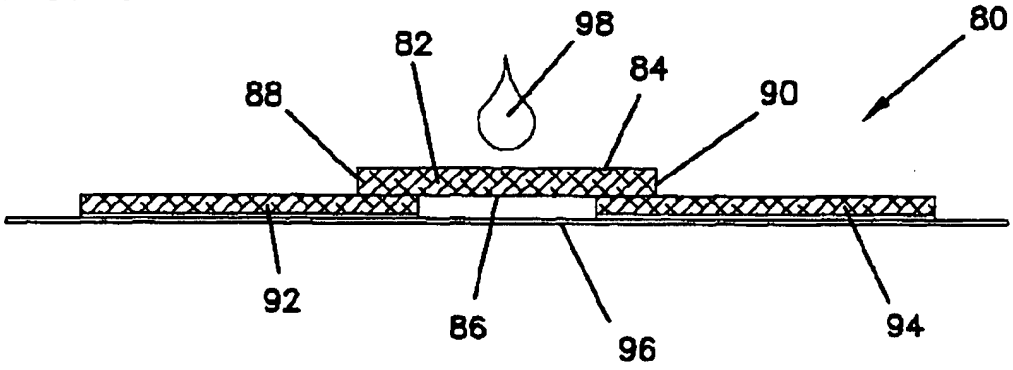

[Drawing 4]

FIG. 4



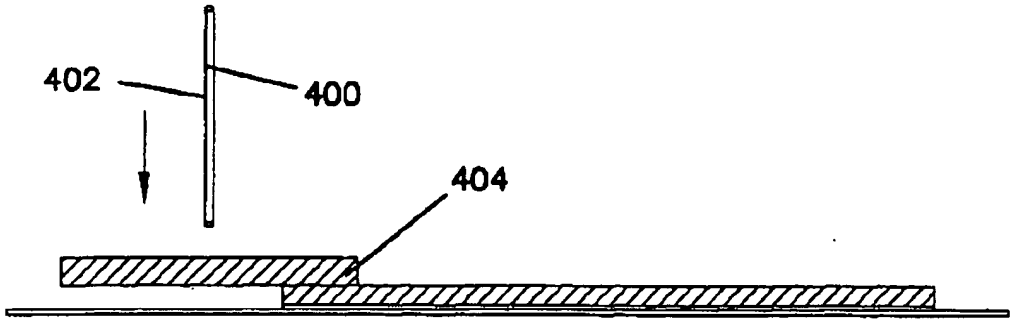

[Drawing 5]

FIG. 5



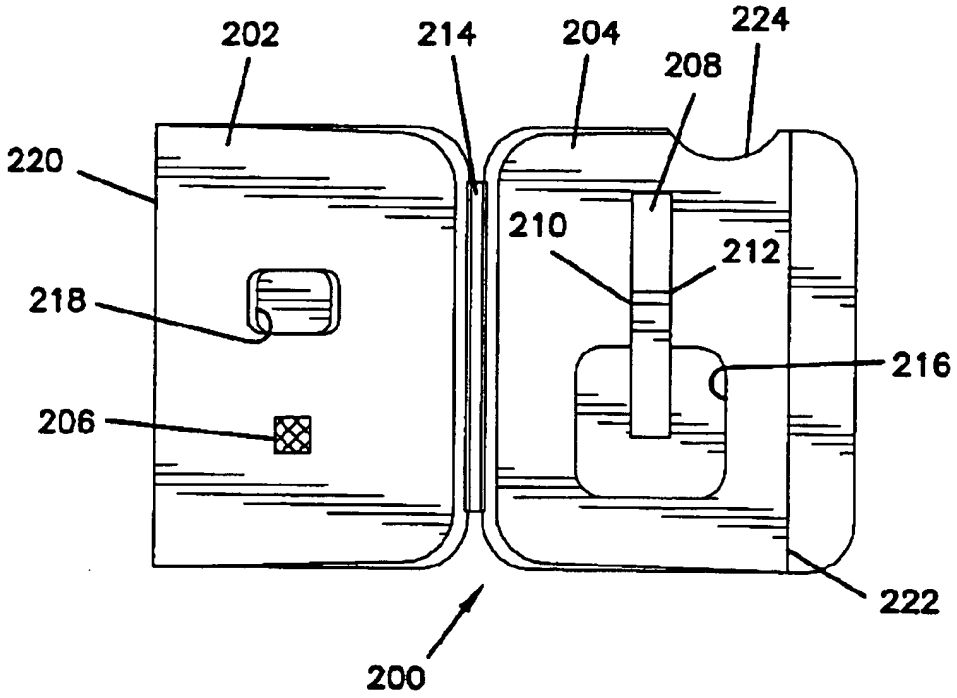

[Drawing 8]

FIG. 8



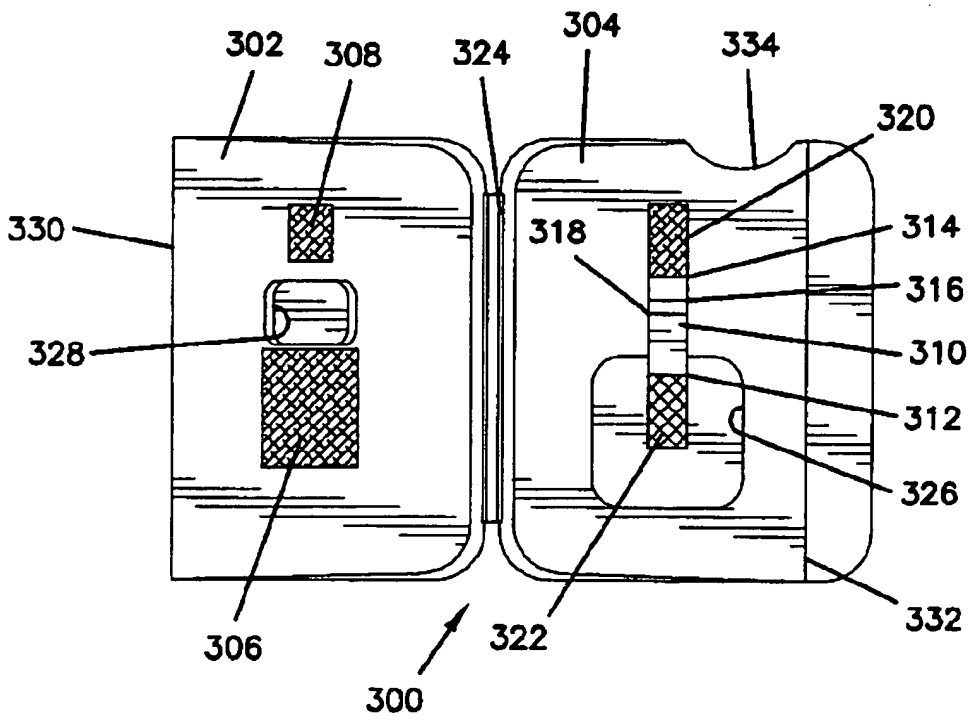

[Drawing 6]

FIG. 6




[Drawing 7]

FIG. 7




[Translation done.]